

FORMATION OF METAL NANOWIRES FOR USE AS VARIABLE-RANGE  
HYDROGEN SENSORS

ABSTRACT

5           The present invention provides for variable-range hydrogen sensors and  
methods for making same. Such variable-range hydrogen sensors comprise a series  
of fabricated Pd-Ag (palladium-silver) nanowires—each wire of the series having a  
different Ag to Pd ratio—with nanobreakjunctions in them and wherein the nanowires  
have predefined dimensions and orientation. When the nanowires are exposed to H<sub>2</sub>,  
10       their lattice swells when the H<sub>2</sub> concentration reaches a threshold value (unique to  
that particular ratio of Pd to Ag). This causes the nanobreakjunctions to close leading  
to a 6-8 orders of magnitude decrease in the resistance along the length of the wire  
and providing a sensing mechanism for a range of hydrogen concentrations.

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HOUSTON\_1\670916\1  
12179-P117US 08/28/2003